What Is Claimed Is:

1   1.   A method to compensate for stress-induced deflection in a compound

2   microprobe, the microprobe including a substrate, a microcantilever extending

3   outwardly from the substrate, and a film formed on the microcantilever, said method

4   comprising the steps of:

5   determining an amount of stress-induced deflection of the

6   microcantilever; and

7   mounting the microprobe so as to compensate for the stress-induced

8   deflection.

1   2.   The method of Claim 1, wherein said mounting step includes selecting a

2   compensation piece based upon the amount of stress-induced deflection.

1   3.   The method of Claim 2, wherein the compensation piece is a wedge

2   generally aligning the microcantilever with a deflection detection apparatus.

1   4.   The method of Claim 2, wherein said step of selecting the compensation

2   piece comprises correcting an angle between a longitudinal axis of the microcantilever

3   and the substrate so as to insure that light reflected from the microcantilever during

4   operation contacts a detector of a deflection detection apparatus.

1   5.   The method of Claim 4, wherein said selecting step includes selecting a

2   dimension of the compensation piece.

1   6.   The method of Claim 5, wherein the compensation piece is a wedge and

2   the dimension is an angle between a microcantilever mounting surface of the wedge and

3   a base of the wedge.

1   7.   The method of Claim 6, wherein said mounting step includes attaching

2   substrate to the mounting surface.

1   8.   The method of Claim 2, wherein said mounting step includes coupling a

2   bottom surface of the substrate to the compensation piece.

1   9.   The method of Claim 2, wherein the stress-induced deflection is a static

2   deflection caused by the film.

1   10.   A microprobe assembly including a microcantilever and a substrate

2   coupled to a support, the microprobe assembly comprising:

3   a compensation piece disposed intermediate the support and the

4   substrate, said compensation piece configured to compensate for an amount of static

5   deflection of the microcantilever.

1   11.   The microprobe assembly of Claim 10, wherein said compensation piece

2   is a wedge-shaped structure having a mounting surface and a base.

1   12.   The microprobe assembly Claim 11, wherein an angle between said

2   mounting surface and said base is selected based on the static deflection so as to align

3   the microcantilever to a deflection detection apparatus.

1   13.   The microprobe assembly of Claim 10, wherein the compensation piece

2   is formed integrally with the support.

1   14.   The microprobe assembly of Claim 10, wherein said compensation piece

2   is made of an insulating material.

1   15.   A method of compensating an amount of static deflection associated with

2   at least one microprobe of a first planar array of microprobes, each microprobe of the

3   array including a substrate, a microcantilever extending outwardly from the substrate,

4   and a film formed on the microcantilever, the method comprising the steps of:

5   directing a beam of light towards a first microprobe of the first array of

6   microprobes;

7   reflecting the beam off the microcantilever of the first microprobe;

8   determining a first amount of static deflection based on the reflected

9   beam; and

10   selecting a first microprobe compensation piece based upon the first

11   amount of deflection.

1   16.   The method of Claim 15, further comprising the step of mounting the

2   first microprobe on the first selected microprobe compensation piece.

1   17.   The method of Claim 15, further comprising the step of:

2   mounting each of the microprobes of the first planar array of

3   microprobes on a compensation piece having the same shape as the first selected

4   microprobe compensation piece.

1   18.   The method of Claim 15, further comprising the step of:

2   repeating said directing, reflecting, determining and selecting steps for

3   each of the microprobes of the first array of microprobes;

4   and then mounting each of the microprobes on a corresponding

5   compensation piece having a shape selected according to a corresponding amount of

6   static deflection.

1   19.   The method of Claim 15, wherein the first compensation piece is a

2   wedge.

1   20.   The method of Claim 19, wherein the wedge includes a base and a
2   mounting surface defining an angle.

1   21.   The method of Claim 20, wherein said selecting step includes computing
2   the angle based on said determining step.

1   22.   The method of Claim 16, further comprising the step of:
2   integrally forming the first array of microprobes from a single wafer
3   prior to the directing step.

1   23.   The method of Claim 15 further comprising the step of:
2   mounting each of a second planar array of microprobes on a
3   corresponding compensation piece shaped according to the first selected microprobe
4   compensation piece.

1   24.   The method of Claim 23, including the steps of:
2   integrally forming the first array of microprobes from a first wafer; and
3   integrally forming the second array from a second wafer.

1   25.   The method of Claim 15, further comprising the steps of:
2   mounting the first array of microprobes on an X-Y translating stage
3   configured to translate in a plane parallel to the first array prior to said directing step;
4   and
5   removing the first array from the X-Y translating stage.

1   26.   The method of Claim 25, further comprising the step of:

2   translating the stage to a first position in which the first microprobe of

3   the first array of microprobes is disposed in an optical path defined by the beam,

4   wherein said translating step is performed prior to said directing step;

5   moving, after said selecting step, the stage to a second position in which

6   a second microprobe of the first array of microprobes is disposed in the optical path;

7   reflecting the beam off a microcantilever of the second microprobe;

8   determining a second amount of deflection of the beam indicative of an

9   amount of static deflection of the microcantilever of the second microprobe;

10   selecting a second microprobe compensation piece based upon the second

11   amount of deflection; and

12   repeating said moving, directing, reflecting, determining and selecting

13   steps for each microprobe of the first array of microprobes.

1   27.   The method of Claim 26, wherein the first and second compensation

2   pieces are wedge-shaped.

1   28.   The method of Claim 27, wherein the compensation pieces each have a

2   base and a mounting surface defining a corresponding angle.

1   29.   The method of Claim 28, wherein the corresponding angles of the

2   compensation pieces are different.

1   30.   The method of Claim 25, wherein the translating stage is motor-driven.

1   31.   The method of Claim 28, wherein the compensation pieces are made of

2   an insulating material.

1   32.   A compound microprobe assembly comprising:

2   a microprobe mount;

3   a microprobe coupled to said microprobe mount, the microprobe having

4   an amount of static stress-induced deflection; and

5   wherein said microprobe mount is configured so as to compensate for the

6   amount of static deflection.

1   33.   The microprobe assembly of Claim 32, wherein said microprobe mount

2   includes a support and a compensation piece having a shape corresponding to the

3   amount of static deflection.

1   34.   The microprobe assembly of Claim 33, wherein the compensation piece

2   is a wedge generally aligning the microprobe with a deflection detection apparatus.

1   35.   The microprobe assembly of Claim 33, wherein said support and said

2   compensation piece are integrally formed.